

March 26, 1935.

S. G. MATTHEWS

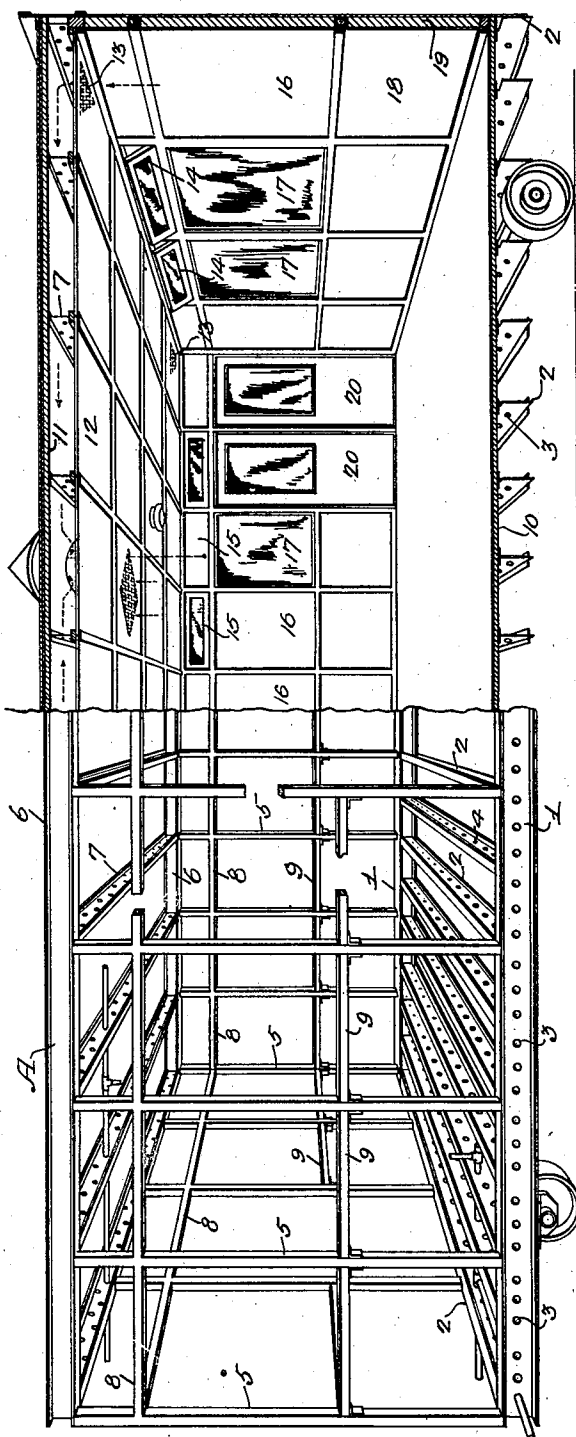
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PORTABLE BUILDING UNIT

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5 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

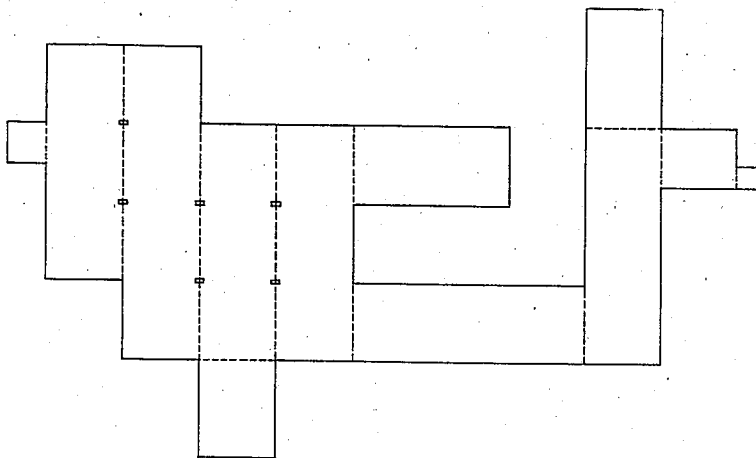


Fig. 4.

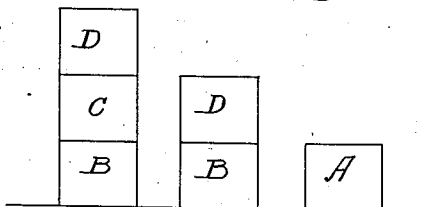
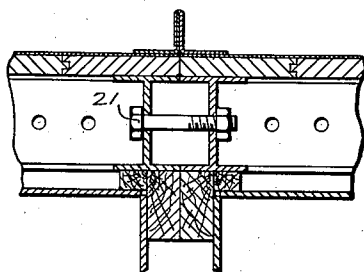


Fig. 3.



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Fig. 5.

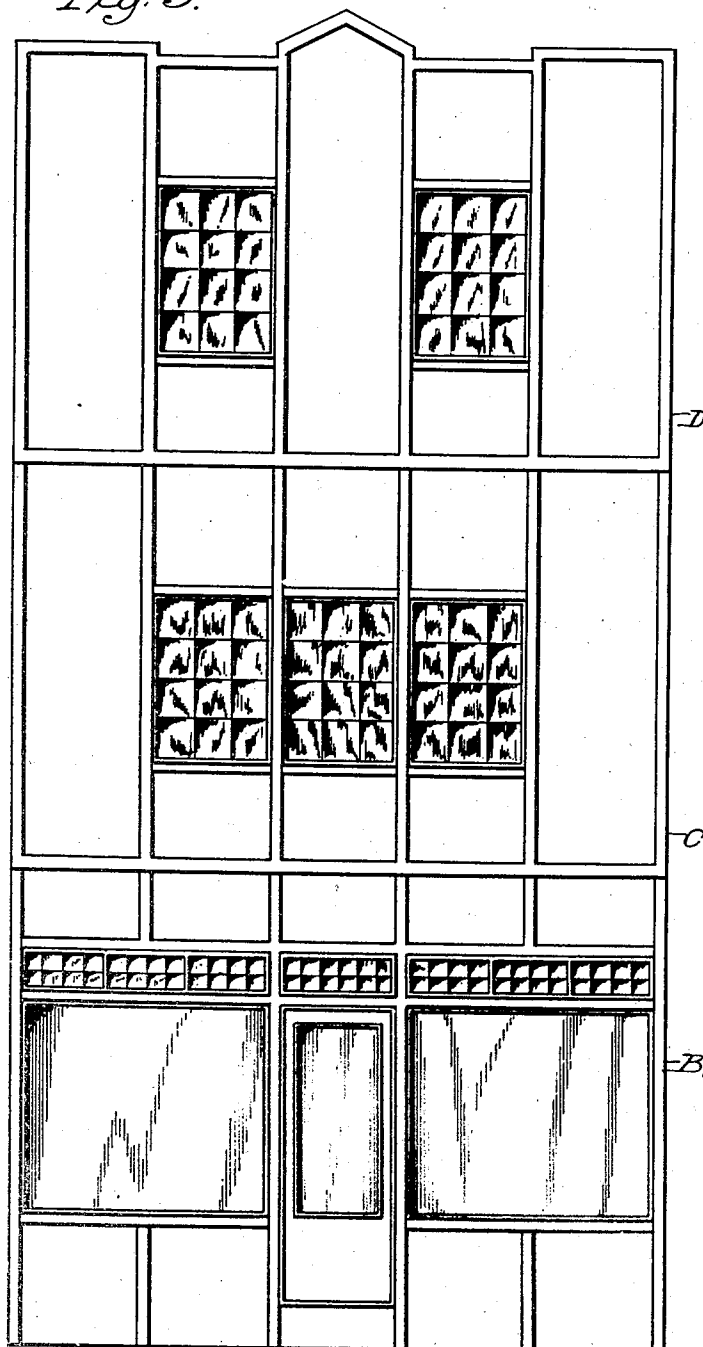


Fig. 13.

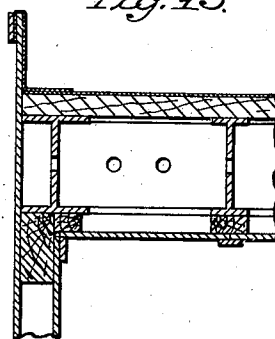
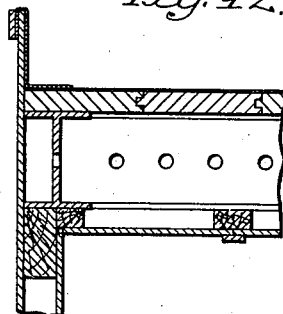


Fig. 12.



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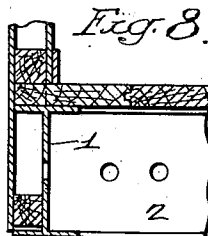
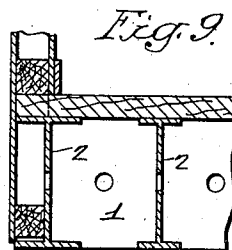
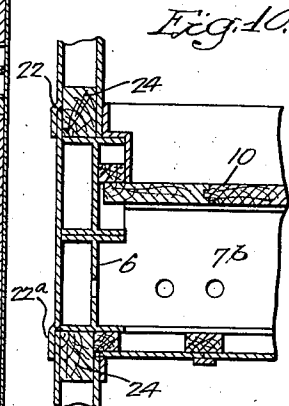
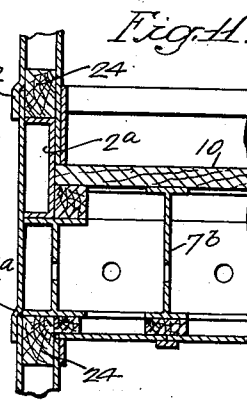
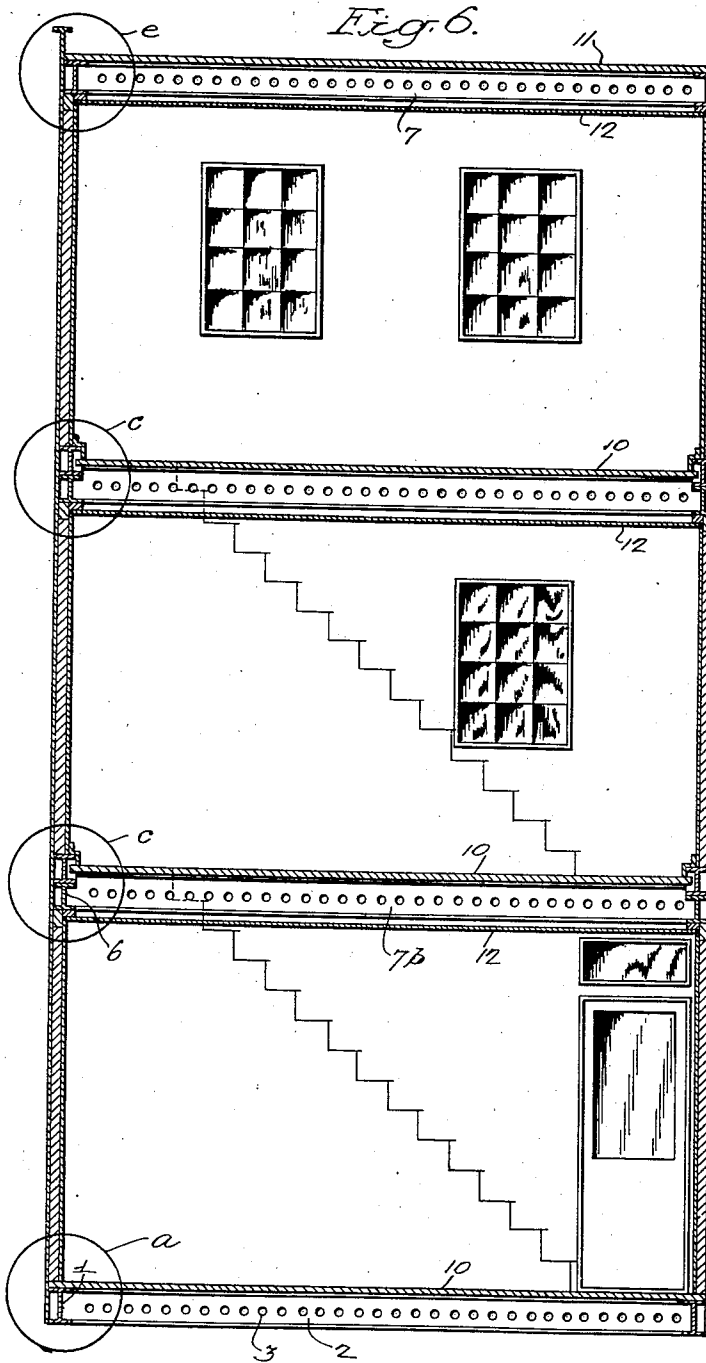
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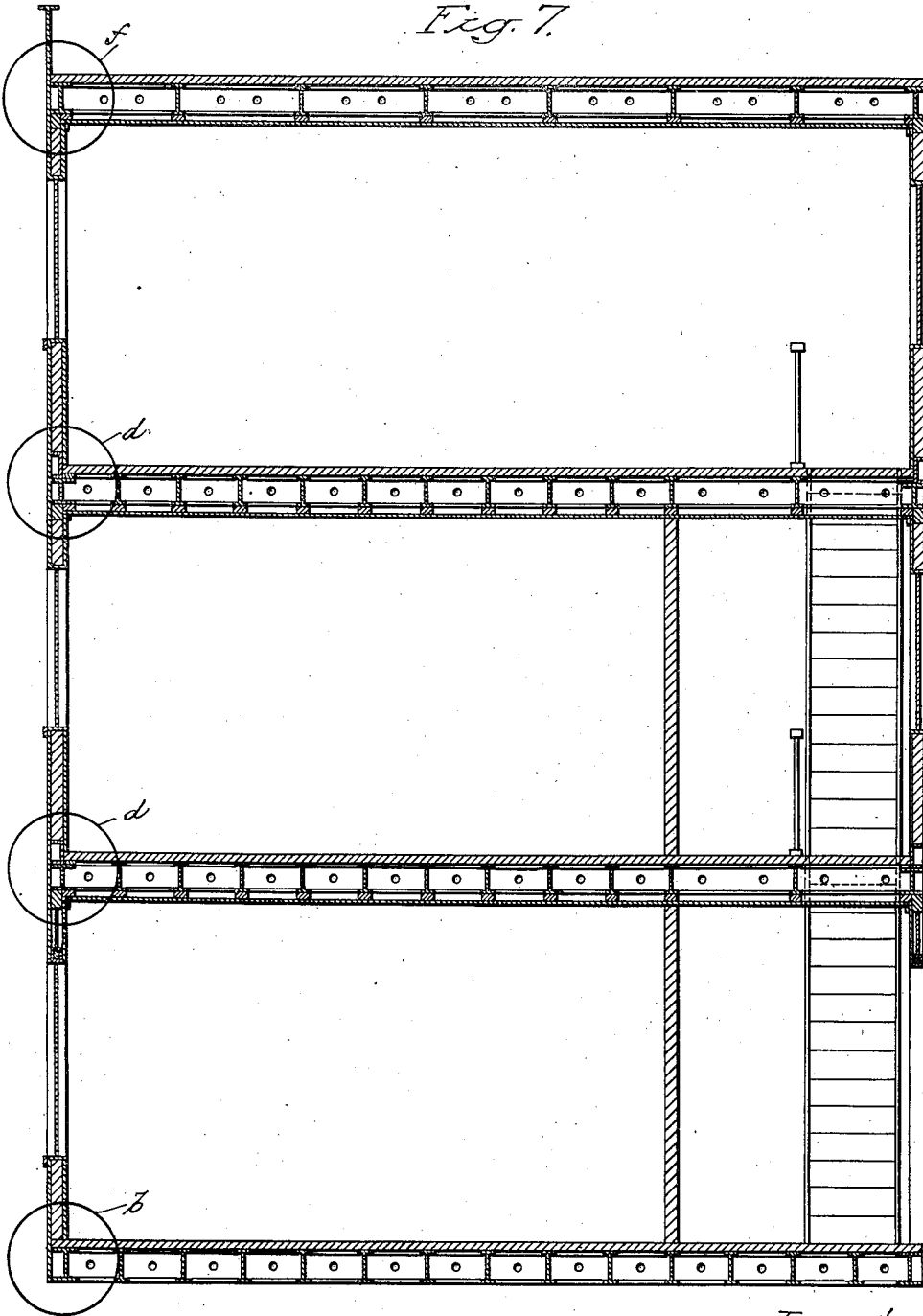
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Fig. 7.



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UNITED STATES PATENT OFFICE

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PORTABLE BUILDING UNIT

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Application February 6, 1932, Serial No. 591,405

3 Claims. (Cl. 189—1)

This invention relates to new and useful improvements in the construction of truly portable buildings and building units.

The principal object of the invention is to provide a building or building unit having certain features of construction which will permit complete fabrication thereof at the plant and which may be transported fully assembled and equipped to a destination as a unit.

Another object of the invention is to provide a building structure as set forth having sufficient inherent rigidity to withstand strains attending transportation, raising, or any movement thereof as a complete unit.

Another object of the invention is to provide a building or structure unit as set forth, having a novel construction permitting the interchangeability of any one or more wall units with any other wall unit or units in any other part of the same or similar buildings or units.

Another object of the invention is to provide a construction unit as set forth which may be readily utilized in conjunction with another unit or units of substantially similar construction to provide a building of practically any desired shape or size.

Another object of the invention is to provide a building wherein the horizontal measurements are of substantially equal dimensions or a multiple of that particular dimension.

Other features and details of the invention are set forth hereinafter and disclosed in the accompanying drawings, in which:

Figure 1 is a view in perspective of a building or building unit having certain sections removed therefrom to disclose the novel features of construction thereof;

Fig. 2 is a diagrammatic view in plan elevation showing a plurality of the building units assembled to form a building of substantial size;

Fig. 3 is an enlarged sectional view showing the method of joining two adjacent units in assembling a building of the type shown in Fig. 2;

Fig. 4 is a diagrammatic front elevation view showing alternative assemblies to which the building units may be adapted;

Fig. 5 is a front elevation of a multi-story building assembled from a plurality of the building units;

Fig. 6 is a transverse vertical view in section of the building disclosed in Fig. 5;

Fig. 7 is a longitudinal vertical view in section through the building shown in Fig. 5;

Fig. 8 is an enlarged view of the area bounded by the circle *a* in Fig. 6;

Fig. 9 is an enlarged view of the area bounded by the circle *b* in Fig. 7;

Fig. 10 is an enlarged view of the areas bounded by the circles *c* in Fig. 6;

Fig. 11 is an enlarged view of the areas bounded by the circles *d* in Fig. 7;

Fig. 12 is an enlarged view of the area bounded by the circle *e* in Fig. 7; and

Fig. 13 is an enlarged view of the area bounded by the circle *f* in Fig. 7.

Referring now to the drawings, and with particular attention to Fig. 1 thereof, a building or unit made in accordance with the present invention comprises a pair of longitudinal base runner members 1, 1 which, for purposes of rigidity, are preferably of I-beam cross section. A plurality of similar support beams 2 are disposed intermediate the beams 1, 1 and transversely with respect thereto. The aforementioned beam members 1 and 2 are preferably provided in each instance with a series of aligned apertures 3 to permit entrance into the building of such service lines as gas and water piping and electrical wire conduits for lighting and telephone connections. It should be noted that the apertures formed in the supporting beams do not sufficiently lessen the strength of said beams as to materially effect the rigidity thereof and tend to lighten the construction.

The side wall framework of the building unit comprises a plurality of tubular posts 5 extending vertically upward from the longitudinal support beam 1, 1 and the extreme members of the transversely positioned support beams 2 at substantially equal spaced intervals. A roof or upper floor structure rests upon the upper extremities of the spaced posts 5 and comprises the longitudinal and transverse beam members 6 and 7 similar to the construction of the base support structure.

In the present instance, a horizontal structural member 8 in the form of a tube is rigidly secured intermediate each of the upright members 5 adjacent the roof or upper floor structure of the framework. A second horizontally positioned member 9 is detachably secured intermediate each of the upright members 5, the said members 9 being vertically spaced from and approximately midway between the structural members 8 and the ground or other base structure upon which it is desired to rest the building or building unit.

The members comprising the base and roof structures, the upright posts 5, and the upper horizontally positioned struts 8, in the present

instance are made rigid at the respective joints thereof, by any suitable means such as welding, or by bolts and the like. On the other hand, and for reasons to be set forth in detail hereinafter, it is particularly desirable that the horizontal strut members 9 be readily removable and respectively interchangeable from the positions intermediate the posts 5. This may be accomplished in any well known manner such as by means of bolts.

The material for the floor and roof or upper flooring 10 and 11 respectively rests in the present instance upon the upper faces of the transverse support beams 2 and 7 respectively and may be secured thereto in any manner suitable to the particular installation. The ceiling or inner surface 12 of the building or unit is secured to the under side of the transverse support beams 7 and is provided with a number of suitably positioned open grating areas as at 13, for the purposes of ventilation which will be set forth more in detail hereinafter.

The outer wall surface of the building comprises a plurality of panels, window frames, doors and the like. The spaces intermediate the horizontal members 8 and the longitudinally positioned roof beams 6 are covered in the present instance by either hinged transom windows 14 or by solid panels 15, as, and in the particular locations about the upper portion of the building that the particular member may be desired. The wall of the building intermediate the horizontal struts 8 and 9 is made of solid panel units 16, or completely fabricated window frames 17 which are interchangeably secured in the respective positions preferably by means of bolts, screws or the like. The side walls of the building, below the horizontal strut members 9 and intermediate the successive upright posts 5 are, in each instance, covered by a solid panel unit 18, which is removably attached thereto and extends a suitable distance below the longitudinal base beam 1, effecting a skirt-like arrangement for the purpose of concealing the structural members of the base structure.

The solid panel units 16 and 18 forming in part the side walls of the building, comprise in the present instance, inner and outer panel sheeting, the space intermediate the sheets being filled with suitable heat insulating material as at 19.

A door or doors 20 may be positioned in any space or spaces intermediate adjacent upright posts 5, and it should be noted that when a door or doors are so positioned, it is necessary that the horizontal strut member 9 be removed from the position thereof intermediate the particular upright posts.

The particular feature of the building resides in the novel construction of the members and panels constituting the side walls thereof, which permits each structural member thereof constituting a wall surface, to be readily interchangeable with every other analogous or similar member of the building, as, for example, suppose that it is desired to change the position of a window 17 residing in one of the side walls of the building to a position in one of the end faces of the building which, at the present time is solidly paneled. Since the window frames occupy a position intermediate the horizontal strut members 8 and 9 respectively and two adjacent upright posts 5, it is only necessary to remove one of the similarly positioned wall panel sections 16 comprising inner and outer panel members, and in-

terchange the window frame 17 with the desired panel wall structure 16.

By the above construction, a building or building unit, as described, may be faced on a lot or a space of ground in a manner suited to that particular site; and when removed from one position to another on that lot, or to another lot, should the relative position of said building with respect to the lot not be adapted to the particular facings of the building, the structure, by reason of the novel interchangeability of the wall units, makes possible the ready adaptation of the said building to the new position or location thereof.

Further let it be supposed that it is desired to position a door 20 now residing in one side wall of the building, to a position in another wall or the same wall at the present time covered by solid panels 16 and 18. In such a case, it is only necessary to remove all of the wall unit intermediate adjacent upright posts 5 and below the particular horizontal strut member 8 including the detachable horizontal strut member 9. The above described solid panel sections and strut 9, when detached, may be readily interchanged in the building with the door 20. It will be noted that by the novel construction herein set forth, utilizing substantially equal horizontal dimensions between the structural members, that, by the use of a suitable templet, the structural units comprising the entire building may be suitably drilled or tapped, making available the interchangeable features set forth.

In order that the building unit may be adequately insulated against both heat and cold, it may be desirable to insert suitable insulating material in the tubular members comprising the side wall framework, and also intermediate the inner and outer wall surface panels as at 19.

The building or building unit herein described, may be of any lateral dimensions which are whole multiples of the particular dimension between the successively spaced upright posts 5. It has been found that the most desirable basic horizontal measurement in the construction of the framework and panels has been found after considerable experiment to be three (3) feet, and that at this measurement it is possible to obtain a templet that would permit tapping or drilling of the structural members so that each would be readily interchangeable with any other similar or analogous member.

In general practice the buildings or building units set forth are entirely completed and equipped at the plant in sizes that will permit them to be transported in accordance with State and municipal regulations, a building or building unit in the process of such fabrication is shown in Fig. 1 of the drawings.

Another particular feature of the building or building unit as described, resides in the adaptability thereof to many building requirements. For instance, the unit which we shall hereinafter designate as unit A, and disclosed in Fig. 1 of the drawings, may be utilized in itself as a small store, station, or any other use not requiring extensive floor space. On the other hand the unit as described is as readily adaptable to industries and other uses requiring extensive floor space and a relatively large building. A requirement such as the above may be fulfilled by providing a number of completed or partially completed and equipped building units as shown in Fig. 1 and delivering said units on the location of the desired building, the said building units being summarily joined end to end or side, or in any other

manner suitable to produce a complete building having the floor shape desired. It will be obvious that in the construction of the assembled units certain of the posts, struts and panels must, of necessity, be eliminated at the place of jointure with another unit so that a continuous and open expanse of floor space will be effected in the completed building. The floor plan of a building so assembled, is shown in Fig. 2 of the drawings.

Furthermore, by merely adding or removing a building unit from the assembly, the said building may be increased or decreased in size, and it should be particularly noted that the addition of units thereto may be made at any point on the outer wall surface and that doors, windows and panels may be interchanged or inserted at any desired location to meet requirements and conditions that may arise at any time.

To securely join the building units in the manner set forth above, the said units are placed adjacent one another and bolts 21 are passed through corresponding apertures 3 in the outer base and roof beam members of the adjacent units and are subsequently tightened, thus drawing the units securely and tightly together. To effectively seal the roofs of the respective units at the line of jointure against the elements of nature, the lip of the roof of one of the adjacent units is cut down to enable the normal lip on the other building unit to be bent over and about the first lip as shown in Fig. 3 of the drawings.

The butting panels at the joints in the side walls of the joined units are faced with a suitable stripping which is detachably secured to the paneling and the other side wall structural members and effectively seals the walls of the building and affords a finished appearance to the exterior thereof.

Certain appendages, such as vestibules or the like, may be readily added at suitable locations and consist of an entirely complete building unit of proper dimensions, that is, the basic measurement as set forth, or a multiple thereof, which may be assembled at the plant and transported to the site of the building.

The building or building unit constituting this invention is capable of use in assembling buildings or structures having more than one floor level, and may be accomplished by successively superimposing one or more of the units on a base or ground floor unit, as shown in Fig. 4 of the drawings. When units of the character set forth are to be utilized in a multi-floor structure, certain minor structural changes must be incorporated in each of the units, otherwise the said units are substantially similar to that previously described and embody all of the novel features of the invention. A structure consisting of but two stories or floor levels comprises units B and D, the base and upper units respectively and a structure having, say three floors comprises units B, C, and D, rising in the order named. The particular designatory characters of the units are used for the purpose of better illustrating the aforementioned minor structural changes required in each of the particular units when used in multi-floored structures.

In the present instance the base unit B is substantially of the same structure as the building unit A which is described in detail previously, with the exception that the roof 11 is eliminated and the transverse roof support beams 7 are of substantially greater height than the longitudinal beams 6 as designated at 7b in Fig. 10, the base

structure of the unit B being substantially as in the previously described unit A and shows in Figs. 8 and 9 of the drawings.

Similarly in the building unit C to permit the floor of the said unit to rest upon the beams of the unit B the transverse beams of the base support of unit C are eliminated and the unit is constructed with merely the longitudinal beams 1 and end beams 2a which in the present instance are channel members in contrast to the I-beam members employed in the unit A. In positioning the unit C in superimposed relation with respect to the lower unit B the lower faces of the flanges of the base support beams of unit C rest upon the upper faces of the flanges of the corresponding beams in the upper floor support structure of the unit B as shown in Figs. 10 and 11. The upper unit is secured in position by means of bolts (not shown) which pass through the contacting flanges and maintain the relative positions thereof with respect to each other.

The upper floor support structure of the unit C is substantially the same as that described in connection with the unit B and in a similar manner the base support structure of unit D is the same as that described for the base structure of the unit C. The roof structure of the unit D is substantially the same as the roof structure employed in the previously described unit A, and further detail description of said structures is believed to be unnecessary.

It should be noted that in the assembly of a building of the multi-floor type, the lower or base unit must necessarily be that unit designated and described as unit B, and the uppermost unit will be that one herein designated as D. It follows therefore, that a two story building will comprise units B and D and that a building having a greater number of floors or stories than two will comprise the base and uppermost units B and D respectively which will be interposed by the desired number of the units C to afford the desired number of floors to the building. It is pointed out, however, that a person desiring for the present time, a building unit of but one floor, with the intention to increase the size of the building by the upward addition of units at some future date, instead of delivering a unit of the type designated as A, which is not arranged for the superimposition of units thereon, a unit of the structural type B may be delivered and provided with a temporary roof structure which may be removed at the proper time to permit the addition of units D, or C and D respectively, as may be desired.

The space intermediate the side walls of the respectively superimposed building units are finished by providing the panel or sheet 23, the upper edge of which is arranged to engage the recess formed by the offset portion of the lower edge of the wall panels of the upper unit as at 22. The lower edge of the panel strip 23 is similarly offset as at 22a to permit the panel 23 to overlap the side wall panel units of the lower unit. The joints are made secure by means of screws (not shown) which pass through the overlying portions of the panels and engage the wood members 24 placed in position for the purpose of receiving the screws.

The building or building unit herein described may have further adaptations and certain minor details of construction may be incorporated in the structure other than set forth; and it is not intended that the extent of modification shall be restricted except as set forth in the appended claims.

What is claimed is:

1. A building unit, adapted for portability as an assembled structure, including a base structure and a roof structure each comprising longitudinal and transverse stringer members rigidly and permanently secured together, upright members extending between the base and roof structures in predetermined minimum spaced relation to each other and rigidly and permanently secured at their ends to said base and roof structure respectively, strut members rigidly and permanently secured parallel to and spaced from the base and roof structures intermediate the said uprights, other strut members arranged for detachable mounting parallel to and spaced from the first mentioned struts and the base structure and intermediate predetermined upright members, panel units detachably mounted in the spaces intermediate the rigid strut members and the roof structure and the upright members, panel units detachably mounted in predetermined spaces intermediate the rigid strut members, the detachable strut members, and the uprights; and panel units detachably mounted in predetermined spaces bounded by the detachable struts, the base structure, and the uprights, the corresponding panel units being relatively interchangeable, one with another.
2. A building unit, adapted for portability as an assembled structure, including a base structure and a roof structure each comprising longitudinal and transverse stringer members rigidly and permanently secured together, upright members extending between the base and roof structures in predetermined minimum spaced relation to each other and rigidly and permanently secured at their ends to said base and roof structure respectively, strut members rigidly and permanently secured parallel to and spaced from the base and roof structures intermediate the said uprights, other strut members arranged for detachable mounting parallel to and spaced from the first mentioned struts and the base structure and intermediate predetermined upright members, panel units detachably mounted in the spaces intermediate the rigid strut members and the roof

structure and the upright members, panel units detachably mounted in predetermined spaces intermediate the rigid strut members, the detachable strut members, and the uprights; panel units detachably mounted in predetermined spaces bounded by the detachable struts, the base structure, and the uprights, and panel units detachably mounted in predetermined spaces bounded by the rigid strut members, the base structure, and the uprights; the latter panels being readily interchangeable with any corresponding panel and strut assembly in the building.

3. A building unit, adapted for portability as an assembled structure, including a base structure and a roof structure each comprising longitudinal and transverse stringer members rigidly and permanently secured together, upright tubular members extending between the base and roof structures in predetermined minimum spaced relation to each other and rigidly and permanently secured at their ends to said base and roof structure respectively, tubular strut members rigidly and permanently secured parallel to and spaced from the base and roof structures intermediate the said uprights, other tubular strut members arranged for detachable mounting parallel to and spaced from the first mentioned struts and the base structure and intermediate predetermined upright members, panel units detachably mounted in the spaces intermediate the rigid strut members and the roof structure and the upright members, panel units detachably mounted in predetermined spaces intermediate the rigid strut members, the detachable strut members, and the uprights; panel units detachably mounted in predetermined spaces bounded by the detachable struts, the base structure, and the uprights, and panel units detachably mounted in predetermined spaces bounded by the rigid strut members, the base structure, and the uprights, the latter panels being readily interchangeable with any corresponding panel and strut assembly in the building.

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